AMENDMENTS TO THE SPECIFICATION

Please amend the first paragraph of the Detailed Description on page 6 as follows:

--As an aid to understanding the present invention, reference is made to Fig. 1 which shows a conventional Bernas ion source 1. This ion source 1 includes an ion chamber 10 and an extraction electrode assembly 40 that extracts an ion beam 18 from the ion chamber. The ion chamber 10 includes first and second sides 11, 12, walls 13, 14 that form the anode, a filament 15 acting as a cathode that passes through first side 11, a filament power supply 24 and a~~n~~ ~~electrode~~ mirror electrode 30 which is electrically coupled to one side of filament 15, and passes through second side 12. The ion chamber 10 is fitted with a gas feed 26 to supply ion precursor gas into ion chamber 10 and an exit slit 16 located in wall 14 through which ion beam 18 is extracted from chamber 10. Once ion beam 18 is extracted, -extraction electrode assembly 40 accelerates -ion beam 18 toward a mass analyzing system associated with an ion implanter (not shown).--

Please amend the second paragraph of page 8 as follows:

--An arc power supply 134 is electrically coupled to filament 115 and ion chamber walls 113,_114. A mirror programming circuit 150 is electrically coupled to filament power supply 124, arc power supply 134 and mirror electrode 130 as shown in Fig. 2. Mirror programming circuit 150 is operable to control the potential on mirror electrode 130 relative to filament 115. Specifically, mirror programming circuit 150 controls the number of electrons trapped between the filament and mirror electrode and thus the rate of ionization of the gas and the resulting beam current. Mirror programming circuit 150 drives the voltage potential on ~~electrode~~ mirror electrode 130 to approach the voltage potential of either filament 115 – in the case where beam intensity is to be increased – or walls 113,_114 – in the case ~~were~~where the beam intensity is to be decreased. When the error signal 152 potential approaches that of filament 115, the number of electrons available for ionization is increased because the potential imposed on mirror electrode 130 repels electrons back toward the center of the chamber. When the error signal potential approaches that of walls 113, 114 and thus the signal 152 potential is positive relative to filament 115 electrons are attracted to and absorbed by the mirror. This reduces the number of electrons available for ionization and, in turn, reduces the rate of ionization of the gas and results in the desired reduction in beam intensity. --

Please amend the paragraph beginning at the bottom of page 8 and concluding on page 9, as follows:

-- Shown in Fig. 4 is a plot showing the relationship of beam current to mirror voltage encountered during the operation of the ion chamber shown in Fig. 2. The plot shows the reduction in beam current that can be achieved by driving the mirror voltage potential toward the potential of the chamber wall. Specifically, Fig. ~~3~~4 shows how the beam current, and thus beam intensity, can be reduced by driving the mirror electrode voltage potential from that imposed on the filament to that imposed on the chamber wall. When making adjustments to the beam current, the difference in ion chamber system response time between the prior art systems discussed above and the present invention is significant. The heating and cooling of the filament in the prior art has typically about a 0.5 second time constant because of the heat capacity of the filament. By contrast, the electron transit time across the arc chamber is measured in microseconds, so response times below 10 to 20 microseconds can be expected from the control of the electronic flux by the system shown in Fig. 2.--

Please amend the paragraph beginning at the bottom of page 9 and concluding on page 10, as follows:

--Shown in Fig.~~4~~ 3 is an alternative embodiment of the ion source of the present invention. In this embodiment, an electrode with an aperture is introduced between filament 215 and the remainder of the ion chamber 210. The chamber 210 comprises first and second sides 211~~-~~, 212 and walls 213, 214, which define the ion chamber and form the anode. Similar to the first embodiment of the present invention, ion chamber 210 is fitted with filament 215 (acting as the cathode) that extends through first side 211, a filament power supply 224 coupled to filament 215, a gas feed 226 and a mirror electrode 230 disposed within wall 212. The resulting ion beam 218 passes through exit slit 216 disposed in wall 214. ~~-~~However, this embodiment includes a grid electrode 240 having an O-shaped grid portion 242 and an outwardly extending support leg 244 as shown in Fig 3. Grid portion 242 presents aperture 246 defined by loop portion 248. Leg 244 passes through and is secured to wall 213 so that grid electrode 240 can be located within ion chamber 210 with the grid portion 242 located in relative proximity to filament 215. Grid electrode 240 is configured to operate like a grid in a conventional vacuum tube and thus it will be

understood that more than one grid may be employed in the ion source without departing from the scope of the present invention. --